B.Sc. Semester-V Examination, 2022-23

ZOOLOGY [Honours]

Course ID : 52612 Course Code : SH/ZOO/502/C-12

Course Title : Principles of Genetics

Time : 1 Hour 15 Minutes Full Marks : 25

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

UNIT-I

1. Answer any **five** of the following questions: 1×5=5

a) Distinguish between nullisomy and monosomy.

b) Define pleiotropy with a suitable example.

c) What are kappa particles?

d) What do you mean by nonsense mutations?

e) Distinguish between sex-influenced and sex-limited inheritance.

f) Can a person with $I^A//I^B$ genotype exhibit O blood group?

g) What is the function of Dsx gene?

h) What is tautomeric shift?

UNIT-II

2. Answer any **two** of the following questions: 5×2=10

a) Discuss briefly the experiment of Benzer in rII locus of T4 bacteriophage. How can you understand that two genes are non-complemented? Comment on it. 3+2

b) Distinguish between primary Down's syndrome and familial Down's syndrome. Diagrammatically explain the events of non-disjunction in meiosis-I and II. 2+3

c) Draw and label the structure of a Long Interspersed Nuclear Element (LINE) with the help of a suitable diagram. Describe the mechanism of Ds (*Dissociation*) element transposition. 2+3

d) What is Bombay phenotype? What is secretor locus? What is recombination hotspot? 2+2+1

UNIT-III

3. Answer any **one** of the following questions: 10×1=10

a) Distinguish between multiple alleles and polygenic inheritance with suitable examples. When does the Mendelian dihybrid cross ratio is modified as 15:1? Explain with a suitable example. 4+6

b) Describe the role of Sry gene along with some autosomal gene in human sex determination. Describe the molecular mechanism of dosage compensation in *Drosophila melanogaster*. 5+5

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